

## 1. General description

Dual Silicon Carbide Schottky diode in a 3-lead TO247 plastic package, designed for high frequency switched-mode power supplies.



## 2. Features and benefits

- Extremely fast reverse recovery time
- Low figure of merit ( $Q_C * V_F$ )
- Highly stable switching performance
- Superior in efficiency to Silicon Diode alternatives
- Reduced losses in associated MOSFET
- Reduced EMI
- Reduced cooling requirements
- RoHS compliant

## 3. Applications

- Power factor correction
- Telecom / Server SMPS
- UPS
- PV inverter
- PC Silverbox
- LED / OLED TV
- Motor Drives

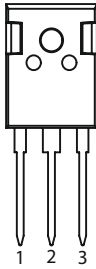
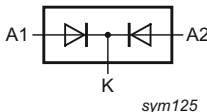
## 4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Values			Unit
<b>Absolute maximum rating</b>						
$V_{RRM}$	repetitive peak reverse voltage		1200			V
$I_{O(AV)}$	limiting average forward current	$\delta = 0.5$ ; square-wave pulse; $T_{mb} \leq 119$ °C; both diodes conducting; <a href="#">Fig. 1</a> ; <a href="#">Fig. 2</a> ; <a href="#">Fig. 3</a>	30			A
$T_j$	junction temperature		175			°C
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Static characteristics</b>						
$V_F$	forward voltage	$I_F = 15$ A; $T_j = 25$ °C; per diode; <a href="#">Fig. 5</a>	-	1.45	1.7	V
		$I_F = 15$ A; $T_j = 150$ °C; per diode; <a href="#">Fig. 5</a>	-	1.95	2.3	V
		$I_F = 15$ A; $T_j = 175$ °C; per diode; <a href="#">Fig. 5</a>	-	2.1	2.5	V
<b>Dynamic characteristics</b>						
$Q_r$	recovered charge	$I_F = 15$ A; $di_F/dt = 500$ A/ $\mu$ s; $V_R = 400$ V; $T_j = 25$ °C; per diode; <a href="#">Fig. 7</a>	-	35	-	nC

## 5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A1	anode		
2	K	cathode		
3	A2	anode		
mb	mb	mounting base; connected to cathode		

## 6. Ordering information

Table 3. Ordering information

Type number	Package name	Orderable part number	Packing method	Small packing quantity	Package version	Package issue date
WNSC2D301200CW	TO247	WNSC2D301200CWQ	Tube	30	SOT429	25-Mar-2013

## 7. Marking

Table 4. Marking codes

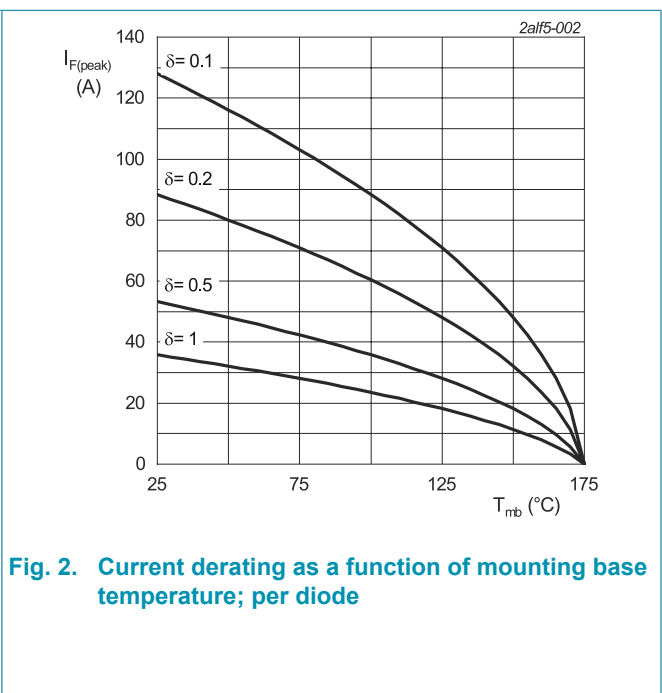
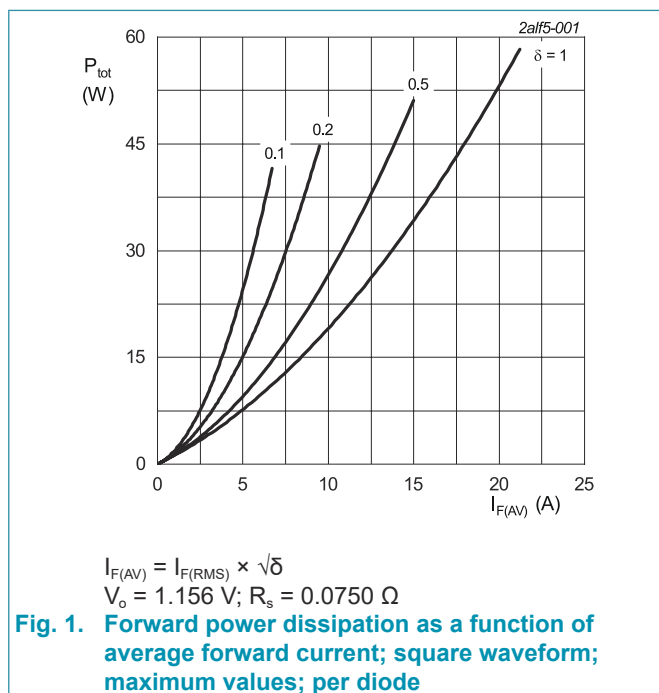
Type number	Marking codes
WNSC2D301200CW	WNSC2D 301200CW

## 8. Limiting values

**Table 5. Limiting values**

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Values	Unit
$V_{RRM}$	repetitive peak reverse voltage		1200	V
$V_{RWM}$	crest working reverse voltage		1200	V
$V_R$	reverse voltage	DC	1200	V
$I_{O(AV)}$	limiting average forward current	$\delta = 0.5$ ; square-wave pulse; $T_{mb} \leq 119\text{ }^\circ\text{C}$ ; both diodes conducting; <a href="#">Fig. 1</a> ; <a href="#">Fig. 2</a> ; <a href="#">Fig. 3</a>	30	A
$I_{FRM}$	repetitive peak forward current	$\delta = 0.5$ ; $t_p = 25\text{ }\mu\text{s}$ ; $T_{mb} \leq 119\text{ }^\circ\text{C}$ ; square-wave pulse; per diode	30	A
$I_{FSM}$	non-repetitive peak forward current	$t_p = 10\text{ ms}$ ; $T_{j(\text{init})} = 25\text{ }^\circ\text{C}$ ; sine-wave pulse; per diode	102	A
		$t_p = 10\text{ }\mu\text{s}$ ; $T_{j(\text{init})} = 25\text{ }^\circ\text{C}$ ; square-wave pulse; per diode	950	A
$I^2t$	$I^2t$ for fusing	sine-wave pulse; $T_{j(\text{init})} = 25\text{ }^\circ\text{C}$ ; $t_p = 10\text{ ms}$	52	$\text{A}^2\text{s}$
$T_{stg}$	storage temperature		-55 to 175	$^\circ\text{C}$
$T_j$	junction temperature		175	$^\circ\text{C}$



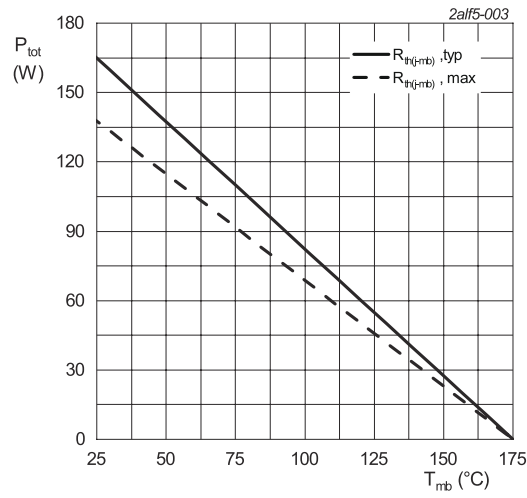


Fig. 3. Total power dissipation as a function of mounting base temperature; per diode

### 9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$R_{th(j-mb)}$	thermal resistance from junction to mounting base	per diode; <a href="#">Fig. 4</a>	-	0.91	1.09	K/W
		both diodes conducting	-	-	0.55	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient free air	in free air	-	40	-	K/W

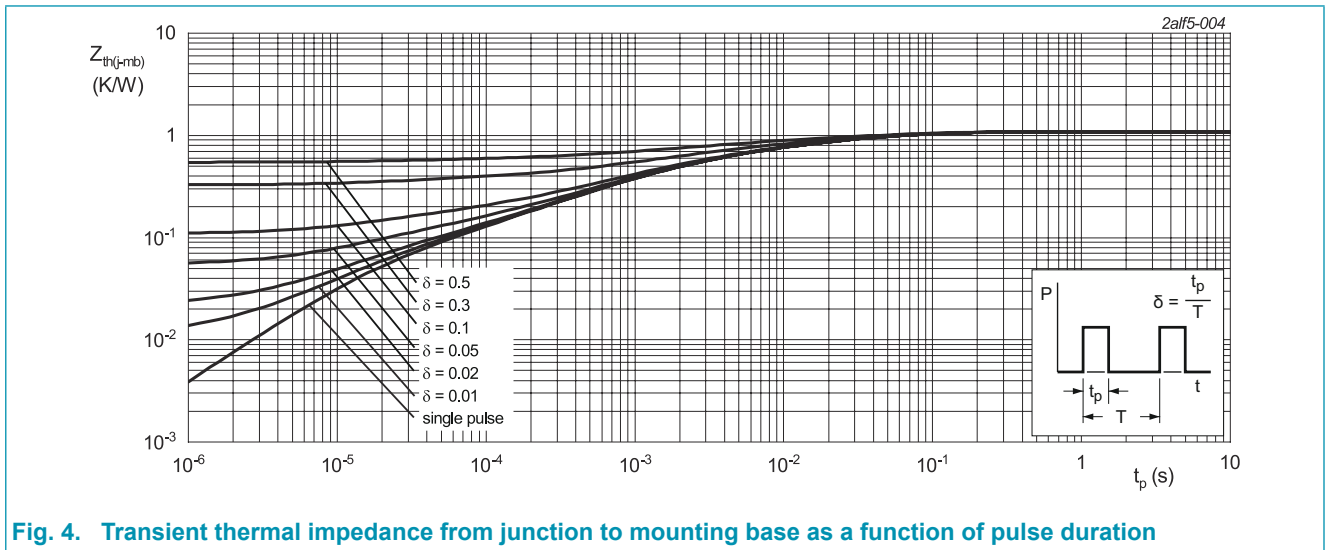
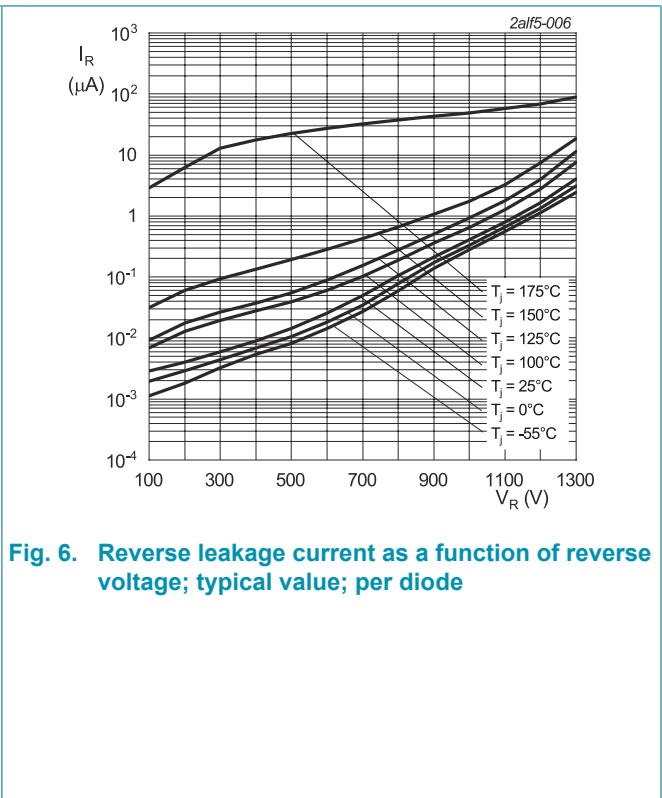
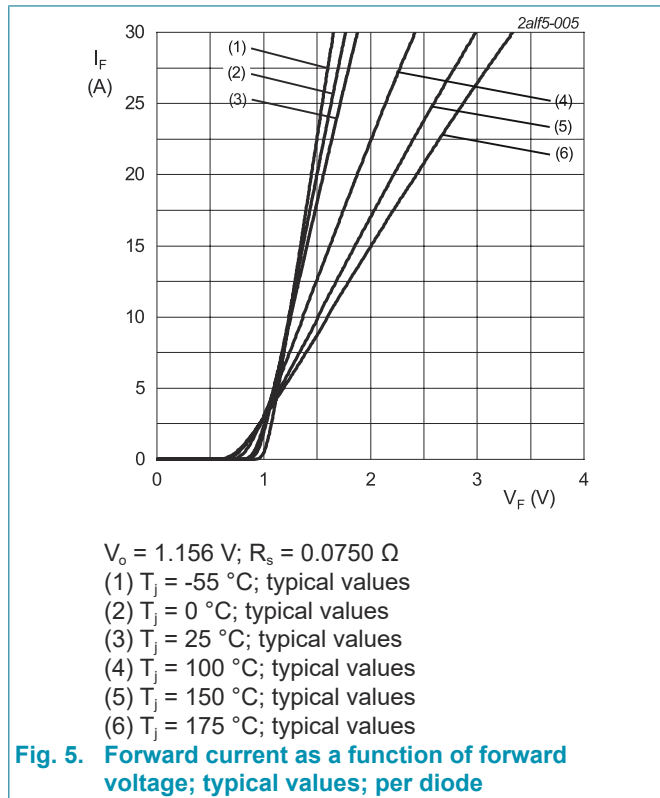


Fig. 4. Transient thermal impedance from junction to mounting base as a function of pulse duration

### 10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Static characteristics</b>						
$I_F$	forward current	$I_F = 15\text{ A}; T_j = 25\text{ }^\circ\text{C};$ per diode; <a href="#">Fig. 5</a>	-	1.45	1.7	V
		$I_F = 15\text{ A}; T_j = 150\text{ }^\circ\text{C};$ per diode; <a href="#">Fig. 5</a>	-	1.95	2.3	V
		$I_F = 15\text{ A}; T_j = 175\text{ }^\circ\text{C};$ per diode; <a href="#">Fig. 5</a>	-	2.1	2.5	V
$I_R$	reverse current	$V_R = 1200\text{ V}; T_j = 25\text{ }^\circ\text{C};$ per diode; <a href="#">Fig. 6</a>	-	5	150	$\mu\text{A}$
		$V_R = 1200\text{ V}; T_j = 175\text{ }^\circ\text{C};$ per diode; <a href="#">Fig. 6</a>	-	80	-	$\mu\text{A}$
<b>Dynamic characteristics</b>						
$Q_r$	recovered charge	$I_F = 15\text{ A}; V_R = 400\text{ V}; dI_F/dt = 500\text{ A}/\mu\text{s}; T_j = 25\text{ }^\circ\text{C};$ per diode; <a href="#">Fig. 7</a>	-	35	-	nC
$C_d$	diode capacitance	$f = 1\text{ MHz}; V_R = 1\text{ V}; T_j = 25\text{ }^\circ\text{C}$	-	700	-	pF
		$f = 1\text{ MHz}; V_R = 400\text{ V}; T_j = 25\text{ }^\circ\text{C}$	-	65	-	pF
		$f = 1\text{ MHz}; V_R = 800\text{ V}; T_j = 25\text{ }^\circ\text{C}$	-	48	-	pF
$E_{as}$	non-repetitive avalanche energy	$I_R = 4.7\text{ A}; L = 10\text{ mH}; T_{j(\text{init})} = 25\text{ }^\circ\text{C};$ per diode	110	-	-	mJ



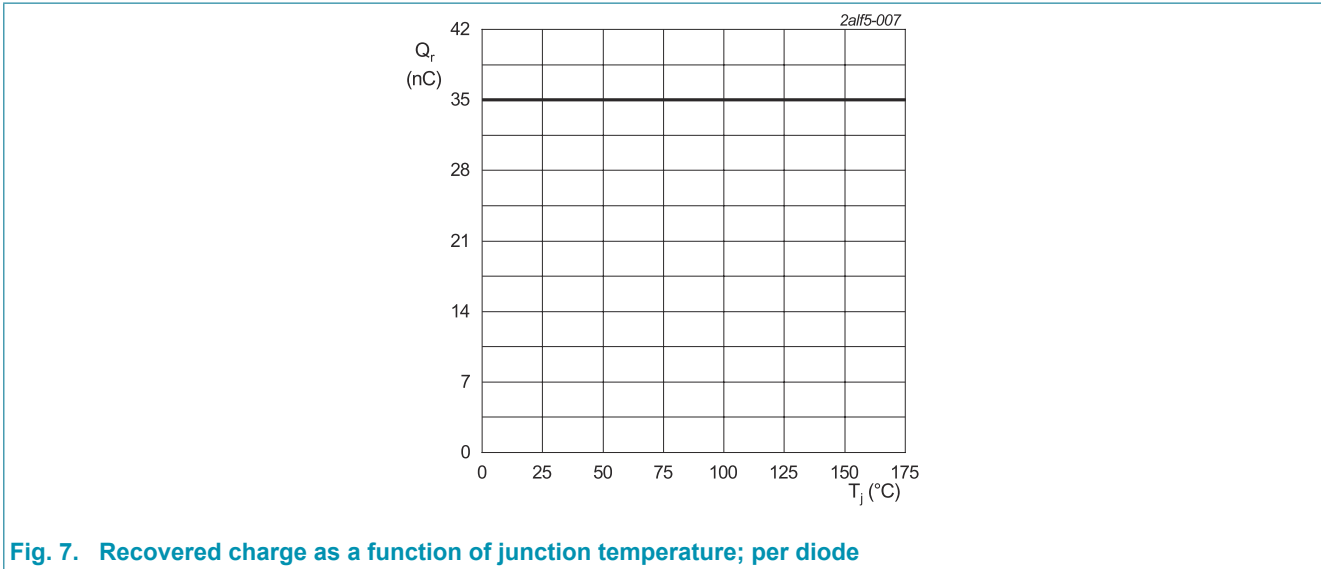
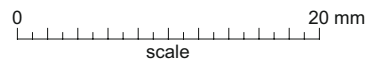
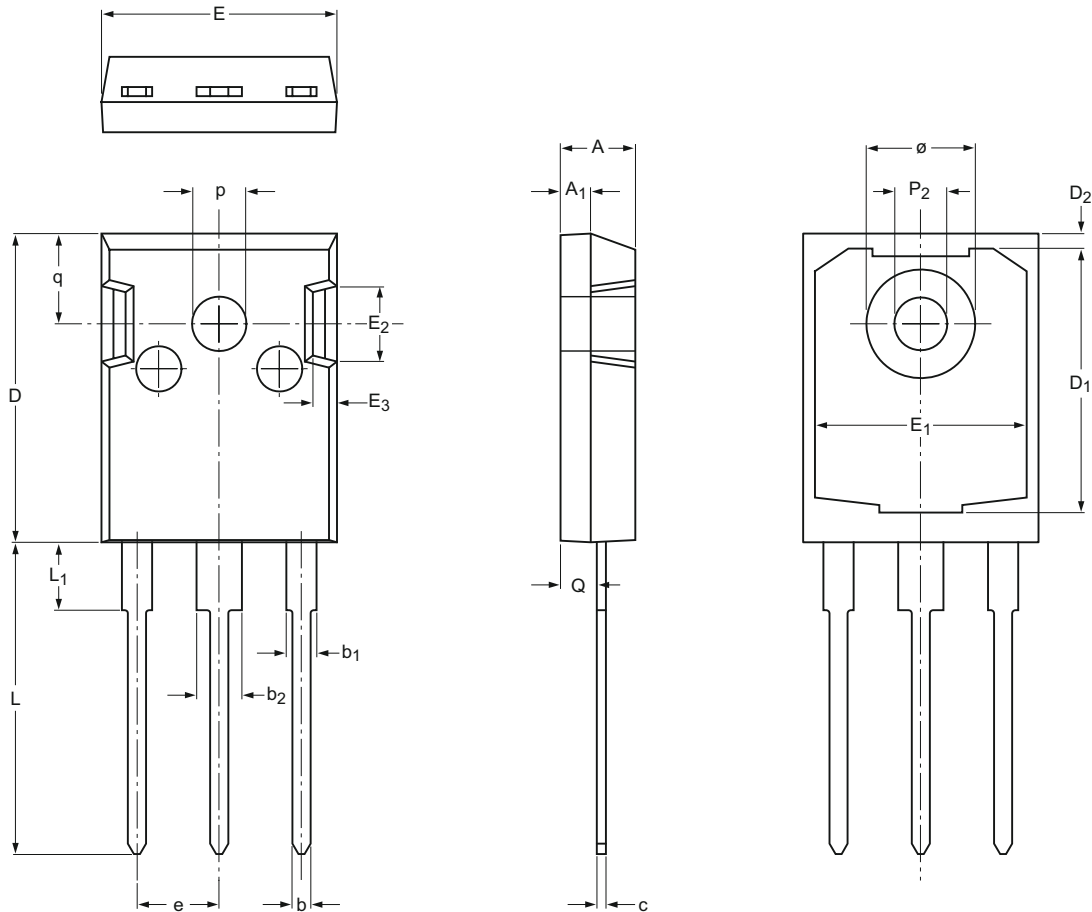


Fig. 7. Recovered charge as a function of junction temperature; per diode

### 11. Package outline

Plastic single-ended through-hole package; heatsink mounted; 1 mounting hole; 3-lead TO-247

SOT429



Dimensions (mm are the original dimensions)

Unit <sup>(1)</sup>	A	A <sub>1</sub>	b	b <sub>1</sub>	b <sub>2</sub>	c	D	D <sub>1</sub>	D <sub>2</sub>	E	E <sub>1</sub>	E <sub>2</sub>	E <sub>3</sub>	e <sup>(1)</sup>	L	L <sub>1</sub>	P <sub>2</sub>	p	Q	q	ø	
max	5.20	2.10	1.40	2.20	3.20	0.70	20.6	17.68	1.20	15.75	14.22	5.20	1.80		20.90	4.75	3.60	3.70	2.60	6.18	7.30	
nom														5.45								
min	4.70	1.90	1.00	1.80	2.80	0.50	20.3	17.28	0.80	15.45	13.82	4.80	1.40		20.40	4.25	3.40	3.50	2.20	5.78	7.10	

Note

1. Basic spacing between centers.

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Outline version	References			European projection	Issue date
	IEC	JEDEC	JEITA		
SOT429		TO-247			-04-09-14- 13-03-25



## 12. Legal information

### Data sheet status

Document status [1][2]	Product status [3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
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